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ESTUARINE AND MARINE POLLUTION (SELECTED STUDIES)

William Marcus Ingram, et al

Robert A. Taft Sanitary Engineering Center
Cincinnati, Ohio

1961

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Selected Studies

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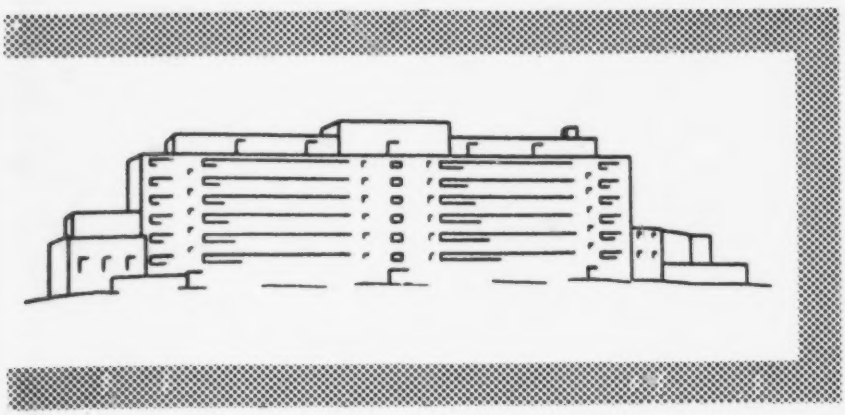

The Robert A. Taft
Sanitary Engineering Center
TECHNICAL REPORT
W61-4

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ESTUARINE AND MARINE POLLUTION

Selected Studies

On biological, bacteriological, and physical aspects,
with major emphasis on the United States literature.

WILLIAM MARCUS INGRAM

THADDEUS A. WASTLER III

Field Operations Section
Technical Services Branch

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Division of Water Supply and Pollution Control

Robert A. Taft Sanitary Engineering Center
Cincinnati, Ohio

1961

Preface

The references selected here will present an insight into the biological, bacteriological, and physical aspects relating to disposal of wastes into estuarine and marine waters. This bibliography was assembled to be used as a training aid for those concerned with the complexities of disposal of wastes into tidal waters. The majority of references cited are of United States or Canadian origin. Most are generally available in university libraries in this country.

Basic to relating the references to applied aspects of waste disposal in the marine environment is an acquaintance with oceanography. An encyclopedic publication on this subject that has proven over the years to be invaluable is the book, *The Oceans – Their Physics, Chemistry, and General Biology,* by Sverdrup, H. V., Johnson, M. W. and R. H. Fleming, Prentice-Hall Inc., New York, pp. 1-1087.

Engineers, scientists, and lay personnel are today greatly concerned with the potential adverse effects that pollutants may have on the marine environment. With municipal and industrial expansion involving the necessity and likelihood of disposal of greater amounts of wastes to estuarine and near-shore waters, never ceasing vigilance is required to maintain such waters in suitable condition for a variety of other uses. With estuaries, bays and near-shore waters serving as nursery areas for commercial and sports fish, workers in water pollution control should ever be aware of the subtle effects that pollution may have in adversely affecting fisheries in such areas. Bacterial pollution of shellfish beds by domestic sewage is well documented, as is similar pollution of bathing beaches. A relatively new concern to those working in environmental health is adequate monitoring of sea disposal areas for radioactive wastes of shore situated nuclear-powered reactors and of berthing areas of nuclear-powered vessels.

Any national oceanographic effort should concern itself with the near-coastal marine environment as well as with oceanographic studies of the deep seas. The inshore waters represent the fisheries "bread-basket" of this country, and nutrients are carried into them from fresh water streams and from land wash to be cycled into food chains which eventually go to support stable marine products that are served "on every table in the land." Also inshore areas, representing the rim of the sea, are those of greatest human water contact, being enjoyed for the fishing, boating, swimming, and water skiing that they afford. A prospectus that presents the national oceanographic interest for the next ten years, and which all who are concerned with the marine environment should read, is *Oceanography 1960 to 1970*-1. – "Introduction and Summary of Recommendations," National Academy of Sciences, National Research Council, 1959, pp. 1-33, Washington, D. C. Readers of this bibliography should explore very valuable reference material that is housed with the Recorder, Waterways Experiment Station, Corps of Engineers, U. S. Army, Vicks-

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burg, Mississippi. In bibliographical material that has been issued from this station there are included references indexed to "Contamination."*

A few examples of potential investigations that could evolve a wiser use of the near-shore marine environment are suggested here. They can be readily related to the selected references in this bibliography, for they include the following:

(1) Studies of the rates of biochemical reactions in sea water in relation to assimilative capacities for sewage and industrial wastes.

(2) Bioassays of industrial wastes to determine their fate and toxicity in marine environments, as they may affect fin fish, shellfish, and destroy intermediate organisms in the food chain.

(3) Studies of the effects on productivity of estuarine and inshore waters by fertilization with sewage and certain industrial wastes.

(4) Investigations involving sedimentation rates under various conditions of water movement and bottom topography.

(5) Studies of the incorporation of radioactive materials in sea water food chains.

(6) Model and field studies relating to flushing of estuaries and diffusion patterns of wastes.

Acknowledgments

Gratitude is expressed to the following persons who participated in supplying references and who in various editorial ways gave of their time to further the completion of this bibliography: Dr. Michael Waldichuk, Biological Station, Nanaimo, B. C. and Dr. L. R. Day, and Messrs. J. Sprague and C. Medcof, Biological Station, St. Andrews, N. B., all of the Fisheries Research Board of Canada; Dr. Donald W. Pritchard, Director of the Chesapeake Bay Institute and Dr. C. H. Hull of the Department of Sanitary Engineering and Water Resources, both of The Johns Hopkins University; Dr. Herbert W. Graham and Dr. Paul Galtsoff of the Biological Laboratory, Woods Hole, Massachusetts, Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service; Dr. Bostwick H. Ketchum, Woods Hole Oceanographic Institution; and Mr. Robert Hyde, Mr. Richard L. O'Connell and Mrs. Martha Jean Wilkey of the Sanitary Engineering Center, Cincinnati, Ohio. In addition, special credit is due Drs. Pritchard and Waldichuk, listed above, who made especially pertinent suggestions that have been incorporated into this document for its betterment.

* Anon., (Committee on Tidal Hydraulics), Corps of Engineers, U. S. Army: Committee on Tidal Hydraulics, Rept. No. 2, Feb. 1954, pp. 81-88; op. cit., Rept. No. 2, Supp. No. 1, June 1955, pp. 29-32; op. cit., Rept. No. 2, Supp. No. 2, May 1957, pp. 35-38; op. cit., Rept. No. 2, Supp. No. 3, May 1959, pp. 45-51.

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